sions, measuring from 0·033 to 0·040 millim. Their number is ten in *T. scutigera*, twelve in *T. scalaris*. *Staphylocystis biliarius* usually has fourteen hooks, which also attain a length of 0·040 millim. The difference in number is so small that it may be a question whether Dujardin did not observe individuals of a single species which had lost more or less of their hooks. M. Villot unhesitatingly refers his *Staphylocystis micracanthus* to *Tænia pistillum*. He sums up his results as follows:—

It is now easy, taking into consideration the habits of their successive hosts, to summarize the history of these parasites. The proglottids, adult individuals, loaded with ova and embryos, detach themselves from the strobile and escape from the intestine of the shrew along with the excrements; then the embryos pierce the envelopes, and, having got free, wait patiently in the moist ground on which they have been deposited for the moment when they can introduce themselves into the body of the *Glomeris*. Their migration must, in the first place, be purely passive; for we cannot otherwise understand the important fact that the Staphylocysts are always attached to the Malpighian tubes. They probably pass into the stomachs of their hosts along with the half-decomposed vegetable débris upon which the latter feed. At the entrance of the intestines the embryos may get into the biliary vessels, travel through these for some time, and then traverse their walls, to take up their abode in the adipose tissue which surrounds those organs. Arrived at their dwelling-place they lose their hooks, which have now become useless, pass into the vesicular state, proliferate, and become scoleces. A shrew meeting with an infested *Glomeris* will devour it as readily as another, introducing into its own stomach at once a hundred scoleces, which on arriving in the intestine of the insectivore will attach themselves, and in their turn bud and form strobiles. The proglottids of the latter will acquire genital organs, and give birth to a new generation.—*Comptes Rendus*, November 19, 1877, p. 971.

On some Monstrosities of Asteracanthion rubens. By M. A. Giard.

On the beach at Wimereux, where the common starfish (*Asteracanthion rubens*) is excessively abundant, especially during the winter and spring months, we find pretty frequently among these animals various interesting monstrosities. Thus we may every year obtain many individuals possessing six rays, instead of five, the normal number.

As the number of rays varies in the group Asteriadæ in allied species, and sometimes even in a particular species, it was natural to see in these aberrations either a simple case of *polymelism*, or a numerical variation in the constitution of the *cœnobium*, according as one gave to each ray of a starfish the value of a member or that of an individual.

There is no doubt that a good many of the six-rayed *Asteracanthions* are really monstrosities of this kind. In fact we find, from time to time, specimens in which one ray is bifurcated about the

middle, or only in the outer fourth; and we may explain, by a similar division taking place at the level of the disk, the numerous cases of *hexamelism*, in which, except in the number of rays, we find nothing abnormal in the constitution of the starfish.

But this is not always the case. I have long since expressed the opinion that the radial symmetry of the Echinoderms is only apparent, and that the *antimera* of those animals are arranged in accordance with a quincuncial spiral, in such a fashion that an urchin or a starfish may be compared, from the point of view of general morphology, not to a regular corolla, but to those flowers which are symmetrical with respect to a plane, such as those of the Papilionaceæ or Labiatæ. In the latter, in fact, there exists a combination of bilateral symmetry and of the spiral arrangement which we also meet with in the Echinoderms. Starting from this notion I wished to see whether the anal glands of *Asteracanthion rubens* had not the same morphological value as one of the pairs of hepatic cæca. For this purpose I opened a certain number of specimens with six arms, and saw, with surprise, that several of them presented two sand-canals terminating at a single madreporic plate, which, however, was formed by the union of two plates. Consequently I had before me true double monsters. Couch, the excellent author of the 'Fauna of Cornwall,' has described* a specimen of *A. rubens* (which, following Fleming, he calls *A. glacialis*), possessing eight rays. This individual presented three madreporic plates, forming the three angles of a triangle inscribed between the bases of four rays; the four other rays were outside this triangle. This specimen was therefore a triple monster, evidently of rarer occurrence than the double monsters of which we have just been speaking, but perfectly analogous to them.

From the preceding statement it follows that the examples of *Asteracanthion rubens* possessing more than five arms may be likened sometimes to the cœnobia of *Botryllus*, in which the number of unities constituting the cœnobium varies from one *cormus* to another, and sometimes in the same cormus; and sometimes to the compound cœnobia of the genera *Amaræcium* and *Polyclinum*. In other words, they are sometimes double monsters, sometimes simple cases of polymelism. It is remarkable that these two distinct cases, presented in a teratological form in *Asteracanthion rubens*, also exist in the normal state in the group of Echinoderms. The *Solasters*, for example, have a variable number of arms, but only a single sand-canal; while some examples of *Ophiactis* have several sand-canals, and are even capable of multiplying by a spontaneous scission of their compound cœnobium into several independent colonies.—*Comptes Rendus*, November 19, 1877, p. 973.

On the Feeding of Dinamœba.

Prof. Leidy remarked that bias frequently proved to be an obstacle in the way of research. In his study of the Rhizopods he had repeatedly watched different kinds of *Amœba* for long periods with

* Mag. Nat. Hist. 2nd ser. no. 27.